所別：**財務金融學系碩士班甲、乙組** 科目：**統計**

1. 請敘述並證明貝氏定理(Bayes' Theorem)。 (15%)

2. 請敘述並證明柴比雪夫不等式(Chebyshev's Inequality)。 (15%)

3. 請找出一元常態分配函數的參數的充分統計量。 (10%)

4. 請找出指數分配函數的參數的最大概似統計量。 (10%)

5. National Electronics, a large electronics chain, wants to handle just one brand of high-quality DVD player. The list has narrowed down to two brands: Suny and Tyaudio. To help make a decision, a panel of 20 audio experts met. A passage using Suny components (labeled A) was played. Then the same passage was played using Tyaudio components (labeled B). A "+" in the following table indicates an individual's preference for the Suny components, a "-" indicates preference for Tyaudio, and a 0 signifies no preference.

Expert																			
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
+	-	+	-	+	+	-	0	-	+	-	+	+	-	+	-	-	+	0	0

Conduct a test of hypothesis at the .05 significance level to determine whether there is a difference in preference between the two brands. (15%)

6. Crash-Free Airlines finds that one-half of a sample of 200 flights are on time when flying from east to west. Of 220 east-bound flights, 105 are on time. Set alpha at 10%. (15%)
   a. What does the resulting interval say about the relative likelihood of arriving on time depending on the direction of the flight?
   b. Your boss, who is flying on Crash-Free this week, wants to be 90 percent certain the error in this estimation does not exceed 10 percent. How large should your sample be?

7. Evaluate the following statement: "The R^2 of an OLS regression always increases as more explanatory variables are added." Is the statement correct? Why or why not? (20%)